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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2017/2018**

COURSE NAME : CIVIL ENGINEERING MATERIALS
COURSE CODE : BFC10502
PROGRAMME CODE : BFF
EXAMINATION DATE : JUNE 2018 / JULY 2018
DURATION : 2 HOURS
INSTRUCTION : ANSWER **FOUR (4)** QUESTIONS ONLY

TERBUKA

THIS QUESTION PAPER CONSISTS OF **THREE (3)** PAGES

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- Q1**
- (a) Fineness is a very important characteristic of cement particles which must be carefully controlled. Give your comment about the statement. (6 marks)
 - (b) Define cement hydration and describe the hydration process. (5 marks)
 - (c) List **THREE (3)** types of cement and describe their applications. (6 marks)
 - (d) Discuss the effect of surface texture and cleanness of the aggregate on the strength of concrete. (3 marks)
 - (e) A sample of wet aggregate is weighed 282.3g. After oven dried, this sample is weighed 271.5 g. The absorption of this aggregate is 1.5%. Calculate the percentage of free water in the sample. (5 marks)
- Q2**
- (a) Explain the relationship between the strength and density of concrete. (10 marks)
 - (b) Discuss the various factors which affect the workability of concrete? (5 marks)
 - (c) Describe the importance of curing. Mention the appropriate time the process should commence and the length of the entire process. (10 marks)
- Q3**
- (a) Fired clay bricks can be classified into common bricks and engineering brick type A and B. List and explain the main parameters needed to classify the types of brick according to British Standard? (12 marks)
 - (b) In the construction of brick walls, the role of the mortar joint is to provide bedding between the units to ensure the uniform transfer of compressive load. The parameter of strength and thickness of the mortar is very important which later will affect the overall strength of the brick wall. Explain how the strength and thickness of the mortar joint could influence the strength of the brick wall. (13 marks)

TENDUKA

- Q4** (a) Reinforcing bars are used in concrete buildings. Some of these bars are given the notations “R”, “Y”, “T” or “H”. Define these notations. (2 marks)
- (b) In a steel building, the steel members are made into different shapes or sections. Sketch **FOUR (4)** of these shapes or sections. (4 marks)
- (c) Give **THREE (3)** important advantages of using steel to construct buildings or bridges. (6 marks)
- (d) There are many shapes and sections of steel that are used for constructing a steel building. Using a pictorial diagram, describe the process of making these steel shapes or sections starting from the raw materials. (8 marks)
- (e) The making of steel result in a waste material called “steel slag”. Meanwhile, the generation of electricity in a power plant result in waste material called “coal bottom ash” or “fly ash”. In your opinion, describe how these wastes are used in concrete. (5 marks)
- Q5** (a) Balau, Belian, Giam, Chengal, Kekatong, Tembusu are names of timber species in Malaysia. State **ONE (1)** common feature in these species. (2 marks)
- (b) The timber species in Malaysia are categorized as “Durable” and “Non-durable”. Explain these terminologies. (4 marks)
- (c) The timber species in Malaysia are grouped from SG1 to SG7. Give the meaning of “SG”. Explain how different species are placed into their respective groups. (6 marks)
- (d) Timber is “hygroscopic” in nature. Explain this terminology and relate it to the need for drying process. (8 marks)
- (e) Timber behaves completely different from steel. Provide **ONE (1)** major difference in the foundation of a steel building to a timber building. Give reasons to support your answer. (5 marks)

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- END OF QUESTIONS -